REMARKS

Claims 1-29 are currently pending in the present patent application. In the Office Action, the Examiner allowed claims 4, 8, 9, 11, 14, 19, 23, and 26, but rejected claims 1-3, 5-7, 10, 12, 13, 15, 16-18, 20-22, 24, 25, 27, 28, and 29 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,324,030 to Cheung *et al.* ("Cheung") in view of U.S. Patent No. 6,426,845 to Sacks *et al.* ("Sacks").

Claim 1 recites a position burst demodulator including an input circuit that receives and squares first and second samples of a first servo position burst. An intermediate circuit adds the squared first and second samples to generate a first sum and an output circuit calculates the square root of the first sum.

For example, referring to FIGS. 5-6 and paragraphs [30] – [35] of the patent application, a multiplier 74a squares an even sample 60a of a servo position burst (e.g., burst Bj of FIG. 4) and a multiplier 74b squares an odd sample 62a of the servo position burst. A summer 76 sums the squares of the samples 60a and 62a, and a root circuit 78 takes the square root of this sum, the square root being proportional to or equalling the magnitude of the servo position burst as sensed by a read head.

In contrast, Cheung neither discloses nor suggests calculating a square root of the sum of the squares of samples of a servo position burst. On page 2 of the Office Action, the Examiner states that Cheung discloses an "input circuit operable to receive and square samples of a first servo position burst," citing column 8, lines 1-15. Cheung does not square such samples but instead Cheung discloses a filter 154 for filtering burst-interval sample values X_n and for generating values Y_n as respective sums of the filtered values X_n over a servo information signal cycle. See Figures 2 and 3, column 7, line 35 – column 8, line 9. After these sample values have been summed to develop the values Y_n, a squarer 164 squares each value Y_n to generate a corresponding value $Z_n = Y^2_n$. *Id.* Cheung accordingly does not disclose receiving and squaring individual samples of a servo position burst.

The Examiner next states that Cheung discloses an "intermediate circuit ... operable to add the samples to generate a first sum," citing column 8, lines 15-32. As just described, Cheung sums the sample values X_n and to generate values Y_n and the squarer 164 thereafter squares each value Y_n. Thus, Cheung does not disclose or

suggest summing squared sample values but instead discloses summing sample values and then squaring this sum. Cheung therefore also does not disclose or suggest summing the squared samples to generate a first sum $Z_n = Y^2_n$.

Finally, the Examiner states that Cheung does not "explicitly teach wherein two servo samples are being used for the procedure" but points to Sacks for teaching "a demodulator/circuit in which two servo samples 202 and 206 ... are sampled, added, and then its square root is calculated," citing column 7, lines 9-19, column 7, line 52 to coumn 8, line 65, and Figure 7 of Sacks. The undersigned agrees that this is what Sacks teachs, which distinguishes even the combination of Sacks and Cheung from the recited elements of claim 1. The position burst demodulator of claim 1 first squares first and second samples of a servo position burst, then adds the squared first and second samples to generate a first sum, and finally calculates the square root of the first sum.

Also note that Sacks is directed to an asynchronous demodulator. Sacks discusses a null type servo pattern that typically includes a phase field and a position error field. See column 1, lines 63-67 to column 2, lines 1-48. A phase-locked loop (PLL) is typically used to acquire the phase of the phase field, and this phase information is used for demodulating the position error field. *Id.* Sacks states that the phase fields must therefore be sufficiently long to enable the PLL to lock onto the phase and frequency of a corresponding readback signal, and that such long fields take up space that could otherwise be used for storing data. *Id.* Thus, there is no suggestion or motiviation to combine Sacks, which discloses an asychronous demodulator as an alternative to synchronous demodulators, with the teachings of Cheung which is directed to a synchronous demodulator.

The combination of elements recited in claim 1 is therefore allowable. Claims 5, 10, 16, and 20 are allowable for reasons similar to those recited above in support of the patentability of claim 1. The claims that depend from each of these independent claims are allowable for at least the same reasons as the corresponding independent claim and due to the additional limitations added by each of the dependent claims.

Amended claim 12 recites a circuit operable, in part, to receive fewer than ten total samples per cycle of a first servo position burst, the total samples including even and odd samples, and to receive fewer than ten total samples per cycle of a second

servo position burst, the total samples including even and odd samples. The circuit for the even and odd sample for each burst sums the even samples, sums the odd samples, squares these sums, sums these squared sums and obains the square root value of the summed squared sums. The circuit calculates from the square root values a head position error signal from the samples of the first and second bursts only such that the accuracy of the error signal is independent of the timing of the samples with respect to the bursts.

For example, referring to Figure 6 and paragraphs [32] – [35] of the patent application, a circuit 70 can calculate a head-position error signal from the magnitudes MAGA and MAGB of only two servo position bursts (*e.g.*, bursts Aj+1 and Bj), and can calculate MAGA and MAGB from samples of only these two bursts. That is, the circuit 70 can calculate the head-position error signal from samples of no more than two bursts.

Neither Cheung nor Sacks, whether taken singly or in combination, discloses or suggests calculating a head-position error signal as recited in amended claim 12. Figure 2 in Sacks merely shows a conventional null type servo sector pattern and does not disclose or suggest calculating a head-position signal from this pattern in the manner recited in amended claim 12. The combination of elements recited in amended claim 12 is therefore allowable.

Independent claims 15, 24, and 27 are allowable for reasons similar to those recited above in support of the patentability of claim 12. The claims that depend from each of these independent claims are allowable for at least the same reasons as the corresponding independent claim and due to the additional limitations added by each of the dependent claims. Also note that claim 21 has been amended to correct a minor typographical error. This amendment does not narrow the scope of claim 21.

In light of the foregoing, the claims are in condition for allowance, which is respectfully requested. In the event additional fees are due as a result of this amendment, you are hereby authorized to charge such payment to Deposit Account No. 07-1897.

If the Examiner believes that a phone interview would be helpful, he is respectfully requested to contact the Applicants' attorney, Paul F. Rusyn, at (425) 455-5575.

DATED this 26th day of April, 2005.

Respectfully Submitted,

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